

***Interactive comment on “Airborne observations of mineral dust over Western Africa in the summer monsoon season: spatial and vertical variability of physico-chemical and optical properties” by P. Formenti et al.***

**Anonymous Referee #3**

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General

The paper presents original material and is clearly worthwhile to be published in ACP. Because the other two reviewers point to the right direction of recommendations I can keep my report short.

I learned from these two other reviews (and a bit deeper study of related literature) that there are obviously two major activities of field campaigns in northern and western Africa during the last 5 years, the AMMA/DABEX project and the SAMUM project. In

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the introduction, I miss a paragraph in which these activities are mentioned. A broader picture of all the efforts done in this region in the recent five years is needed (for the readers). In this way, the idea for the AMMA summer campaign becomes more clear.

All these activities are obviously performed to better understand climate, weather/precipitation, and dust conditions (including the role of dust in atmospheric processes of clouds/precip. formation) over northern/western Africa as a whole. So, what were the goals of these field campaigns, of AMMA, DABEX, DODO and SAMUM (2006, 2008)? This SAMUM/Cape Verde project in 2008 seems to be rather similar to the AMMA activities, but there is no hint to these studies. I understand there are almost no publications yet, but does this justify to say nothing to all these efforts? It seems to be that the field studies are complementary, AMMA is operating in the center (source) of all these dust and smoke plumes and SAMUM in 2008 focusses on the same aerosol, but later during the outflow to the west (aged aerosol). So it should be easy to formulate the overall picture of these activities.

Other point here: Even if there is no official publication to SAMUM in 2008, the data analysis should be close to be completed. There is a special issue of SAMUM in 2006 (Tellus, 2006). I could imagine that they do the same with the SAMUM 2008 data. Please clarify. So, I would appreciate if there are more comparisons in the paper.

All in all the focus (just on AMMA) in the introduction is too narrow at the moment.

Details

Section 2.: A new inlet is used, the passing efficiency for 9 microns diameter particles is mentioned to be 50%, and a particle counter (GRIMM, 0.3-20 microns diameter) is used. What is the maximum diameter you can handle with this setup?

Section 3, at the end: You mention that there was a ground-based super site at Banzoumbou. Did you have lidar optical profiles for comparison with the aircraft optical properties? Could help to assure that the aircraft profiles describe almost ambient

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aerosols.

Section 4.2: This is one of the subsection where I expected to find some comparison with the SAMUM studies.

Section 4.3.6: Even here, there is no hint to any of the SAMUM activities in 2006, which focussed in dust profiling as Cuesta et al. (2008).

Section 4.5: For the first time (after almost 30 pages), a hint to the similar SAMUM activities is given: 'These values are consistent with most of the available in situ measurements for African dust (. . .Muller 2009, Kandler 2009).' But that's it already (almost)!

Figure 10 and 11: Are there AERONET (or even AMMA) photometers available, providing size distributions for comparison? Such comparisons would be helpful.

Figure 12: I would like to see a similar curve from the SAMUM 2006 campaign (for pure dust) in this plot.

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Interactive comment on Atmos. Chem. Phys. Discuss., 11, 2549, 2011.